IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group	3632	}
Confirmation No	6209	}
Application No	10/614,740	}
Invention	Utility Pole Cross-Arm and Associated Pole-Top Hardware	}
Applicant	Kralic, John Frank	}
Filed	July 8, 2003	}
Attorney Docket	201144.00001	}
Examiner	Wujciak, Alfred J.	}

DECLARATION OF DR. JAIME DE LA REE

I, Dr. Jaime De La Ree, do hereby state under penalty of perjury:

1. My name is Jaime De La Ree. I am presently Associate Professor and Assistant Department Head at Virginia Polytechnic Institute and State University in the Department of Electrical and Computer Engineering.

2. I received a degree of M.S.E.E. from the University of Pittsburgh in 1981, and a Ph.D. from the University of Pittsburgh in 1984. In 1984, I joined the faculty of Virginia Polytechnic Institute and State University, Department of Electrical and Computer Engineering, as Assistant Professor and in 1990, I was promoted to Associate Professor. In 2004, I became Assistant Department Head of the Electrical and Computer Engineering Department. Attached hereto is a curriculum vitae fully setting forth my professional career in detail.

3. My specialty has been power systems and power system protection. I am a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) and a member of the Power System Relaying Committee of IEEE. As part of the Power Area Research Team, I assisted in the development of the Power System Research Laboratory and the Power System Protection/Measurement Laboratory both at Virginia Tech. The principal topic of my research throughout my career has been power systems and power system protection, which includes power distribution systems. I have also authored and co-authored 25 journal papers, most focused on electrical power systems.

4. I have reviewed U.S. Application No. 10/614,740, published as U.S. 2004/0084582 on May 6, 2004. The subject matter is directed to a cross-arm for a utility pole for use in low to medium voltage electricity distribution and transmission. The cross-arm is metallic and coated with an insulatory coating, such as a polymeric material. The polymeric material may be applied by an electrolytic powder coating process, using a powder of the polymeric material. The polymeric material may alternatively be a nylon, a thermoplastic or an epoxy.

5. Over the years, cross-arms for utility poles for use in low to medium voltage electricity distribution and transmission have been made of wood, primarily because of the risk of electrocution to birds and other animals that may encounter the cross-arm of utility poles. Electrocution of birds has been of particular focus because of the risk of causing fires and electrical outages that can result. For that reason, elaborate mechanisms and systems have been designed and used to try to avoid birds sitting on the cross-arms of utility poles used in low to medium voltage electricity distribution and transmission, and to otherwise avoid the birds perching on the cross-arms of utility poles. *See*, for example, *Suggested Practices for Raptor Protection on Power Lines: the state of the art in 1996*.

6. For purposes of this application, a person of ordinary skill in the art would be familiar with the risk of electrocution to birds and other animals that may encounter the cross-arm of utility poles, and particularly the risk of birds causing fires and electrical outages. A person of ordinary skill in the art would also be familiar with the elaborate mechanisms and systems that have been designed and used to avoid birds sitting on the cross-arms of utility poles. Finally, typically such a person of ordinary skill in the art would possess at least a bachelor's degree in electrical engineering and at least one year of hands-on work experience in applying principles of power engineering to low and medium voltage power systems and protection devices therefor.

7. In view of the history in the art, the cross-arm for a utility pole for use in low to medium voltage electricity distribution and transmission claimed in the Application No. 10/614,740 was not obvious to a person of ordinary skill in the art in 2002, when the application was filed, in view of the art of which I am aware. It was also counter intuitive to a person, like me, of more than ordinary skill in the art in 2002.

8. I have been particularly asked to consider U.S. Patent 5,673,182 to Garner and U.S. Patent 2,734,859 to Reilly et al., and to provide my opinion based on my experience whether the disclosures of the '182 patent and the '859 patent provide the evidence that the cross-arm described and claimed in Application No. 10/614,740 was obvious to a person of ordinary skill in the art in 2002. I can state categorically that the information in those two patents does not show that the utility pole described and claimed in the '740 patent application was obvious to one of ordinary skill in the art in 2002 for the reasons stated below.

9. The Garner '182 patent, entitled "Support Frame Assembly for a Printed Circuit Card Having a Tie Bar Bridging Across the Frame," discloses a support frame assembly for a

standard peripheral component interconnect (PCI) card. '182 patent, col. 1, ll. 39-41. The support frame assembly "controls or limits displacements (rotational and translational) along two axes of the circuit card." *Id.* col. 1, ll. 34-36. "A bridging tie bar 50 is provided and includes the horizontal span 52 and the two legs 54 extending perpendicularly downward therefrom." *Id.* col. 2, ll. 42-44. The support frame assembly is fastened to the card 12 and to the bridging tie bar 50 with threaded fasteners. *Id.* col. 1, ll. 55-60. Garner '182 does not disclose any subject matter relating to utility poles, utility pole cross-arms or power transmission lines of any kind, nor otherwise present any material helpful in solving the problem addressed by the claimed subject matter of the '740 application.

10. Reilly '859 is a "Plating Rack" and is particularly a "current conducting plating rack[] on which relatively small articles to be plated are supported in a plating solution." '859 col. 1, ll. 15-18. Reilly '859 discloses improvements in the construction of a plating rack that comprise "an elongated rack body member or bar 1 to one end of which is connected a hook indicated generally at 2 to provide a means for suspending the rack in a plating solution." *Id.* col. 2., ll. 21-26. "The major portion of the rack bar 1 is adapted to be immersed in the electroplating bath and accordingly is covered with a protective film or layer of a suitable acid-resistant insulating material 7 such as a rubber-like composition or a synthetic resin, to protect the rack bar from corrosion by the plating solution as well as prevent wasteful deposit of plating material on the bar." *Id.* col. 2, ll. 41-47. In particular, the ends 24 "of each supporting arm are exposed, that is, uncoated so that the particular articles to be plated and supported on these ends 24 will also make electrical contact with the arms." *Id.* col. 3, ll. 30-33. Each arm 12 also has a contact pin 25 that makes electrical contact with the metallic body of the bar 1. *Id.* col. 4, ll. 5-14. Reilly '859 does not disclose any subject matter relating to utility poles, utility pole cross-

arms or power transmission lines of any kind, nor otherwise present any material helpful in solving the problem addressed by the claimed subject matter of the '740 application.

11. I have also been asked to consider U.S. Patent 5,909,359 to Summers et al., U.S. Patent 5,888,623 to Katzer, U.S. Patent 5,595,416 to Horwill, and German Patent 2352872 to Volpone alone or in combination with U.S. Patent 5,673,182 to Garner.

12. U.S. Patent 5,909,359 to Summers et al. teaches an apparatus for stabilizing short or small, commercial off the shelf (COTS) printed circuit boards for personal computers (PC). '359 patent, col. 2, ll. 10-14. The '359 patent discloses "[e]lectrical insulation 100 can be used on the extender bracket apparatus 30 to isolate the short COTS board 20 from the extender bracket apparatus 30 as well as from the computer chassis." *Id.* col. 2, ll. 49-52. "The electrical insulation 100 can be a dielectric coating, a film or some other simple to apply dielectric material." *Id.* col. 2, ll. 54-56. The '359 patent does not provide any information either alone or in combination with the disclosure of the Garner '182 patent that would relate to a dielectric coating or the strength thereof for utility pole cross-arms in low to medium voltage electricity distribution and transmission systems.

13. U.S. Patent 5,888,623 to Katzer teaches a sanitary article, particularly a sanitary fitting or a plumbing fitting, having a coated surface and a process for applying a surface coating to a sanitary article. '623 patent, col. 1, ll. 13-17. The coating may be formed from a thermosetting resin, particularly an epoxy resin. *Id.* col. 2, ll. 30-32. The '623 patent does not teach anything related to the problems encountered with cross-arms for a utility pole for use in low to medium voltage electricity distribution and transmission. The '623 patent does not provide any information considered alone or together with the disclosure of the Garner '182 patent that would relate to a cross-arm for a utility pole in low to medium voltage electricity

distribution and transmission systems having an electrolytic powder coating of polymeric material, such as thermoplastic or epoxy.

14. U.S. Patent 5,595,416 to Horwill teaches "a retaining clip for securing a hood protector or shield to a vehicle hood." '416 patent, col. 1, ll. 46-47. The clip may be coated with a plastic coating such as nylon to prevent damage to a vehicle hood protector with which the clip 80 is to be used. *Id.* col. 6, ll. 23-28. The '416 patent does not teach anything related to the problems encountered with cross-arms for a utility pole for use in low to medium voltage electricity distribution and transmission. The '416 patent does not provide any information, considered either alone or in combination with the disclosure of the Garner '182 patent, that would relate to coating a cross-arm for a utility pole in a low to medium voltage electricity distribution and transmission system with nylon.

15. German Patent 2352872 to Volpone teaches an arrangement 10 for mounting a component 12 on a printed circuit board 14. '872 patent, col. 2, ll. 3-4. The arrangement 10 includes placing a heat sink 16 on the opposite side of the PCB to the component, an aperture 18 formed in the PCB 14 between the component 12 and the heat sink 16, and placing a thermally conductive gel 20, or other heat conductive, electrically insulating, medium in the aperture 18. *Id.* col. 2, ll. 5-7. The '872 patent does not provide any information, considered either alone or in combination with the disclosure of the Garner '182 patent, that would relate to a cross-arm for a utility pole in a low to medium voltage electricity distribution and transmission system having an electrically insulating material located between the utility pole and the cross-arm.

16. If one were looking in 2002 for a solution to the problem in utility pole cross-arms that has been a tradition in low to medium voltage power distribution and transmission, one of ordinary skill in the art would not view the Garner '182 patent, alone or in combination with

U.S Patent 5,909,359 to Summers et al., U.S. Patent 5,888,623 to Katzer, U.S. Patent 5,595,416 to Horwill, and German Patent 2352872 to Volpone, as helpful in solving the problem addressed by the '740 application.

17. I have also been asked to consider U.S. Patent 3,803,570 to Barlow et al., Japan Patent 411210271A to Sagawa et al., U.S. Published Application No. 2004/0035602 to White, and U.S. Patent 6,146,576 to Blackmore alone or in combination with U.S. Patent 2,734,859 to Reilly et al.

18. U.S. Patent No. 3,803,570 to Barlow et al. teaches a moisture indicating system having a probe 16 made from metal rod 28 having an insulating sleeve and a pointed metal tip 32 that is pressed into the earth. *Id.* at col.3, ll. 23-30. A dielectric element is positioned between the metal rod 28 and the metal tip 32 to create a capacitor when the probe is in the ground. The probe 16 is insulated so that the dielectric element positioned between the metal rod 28 and the metal tip 32 enables "a series-connected variable capacitor and resistor path to the ground...." The '570 patent does not teach anything related to the problems encountered with cross-arms for a utility pole for use in low to medium voltage electricity distribution and transmission or how to solve such problems. The '570 patent does not provide any information in combination with the disclosure of the Reilly '859 patent that would relate to a dielectric coating or the strength thereof for a cross-arm for a utility pole in low to medium voltage electricity distribution and transmission systems.

19. Sagawa '271 is a "Beam Pipe Mounting Structure" and is especially useful "in protective fences, especially in locations such as walkways in public parks." Sagawa '271 discloses a "beam pipe mounting structure [that] comprises loosely inserting the end of a beam pipe 20 into a mounting hole 11 disposed on the side of a tubular post 10 leaving a gap, and

driving a wedge-shaped pipe anchorage device 30 having a side 31 capable of closing the majority of the gap 12 and anti-slip projections 32 into this gap. In particular, the wedge-shaped pipe anchorage device 30 comprises a plastic molded compact, and the tubular post 10 and the beam pipe 20 comprise plastic coated metal pipes with an imitation wood." JP '271 Translation at 1. Sagawa '271 does not disclose any subject matter relating to utility poles, utility pole cross-arms or power transmission lines of any kind, and does not pertain to the problem addressed and solved by the claimed subject matter of the '740 application in a related art. The Sagawa '271 patent does not provide any information in combination with the disclosure of the Reilly '859 patent that would relate to a cross-arm for a utility pole in a low to medium voltage electricity distribution and transmission system having a polymeric material coating.

20. U.S. Published Application No. 2004/0035602 to White discloses an adjustable aerial terminal. U.S. Published Application No. 2004/0035602, Para. [0003]. The housing of the terminal may be coated with polyurethane to withstand environmental conditions. *Id.* at Para. [0025]. The '602 application does not provide any information either alone or in combination with the disclosure of the Reilly '859 patent that would relate to coating a cross-arm for a utility pole in a low to medium voltage electricity distribution and transmission system with a polymeric material.

21. U.S. Patent No. 6,146,576 to Blackmore discloses a composite material impregnated with heat curable resin. U.S. Patent No. 6,146,576, col. 1, ll. 11-13. The composite material in the '576 patent may be impregnated with epoxy. The '576 patent does not teach anything related to the problems encountered with cross-arms for a utility pole for use in low to medium voltage electricity distribution and transmission. The '576 patent does not provide any information in combination with the disclosure of the Reilly '859 patent that would relate to

coating of a cross-arm for a utility pole in a low to medium voltage electricity distribution and transmission system with a polymeric material coating, such as a nylon, a thermoplastic, or an epoxy.

22. If one of ordinary skill in the art were looking in 2002 for a solution to the problem in utility pole cross-arms that has been a tradition in low to medium voltage power distribution and transmission, he or she would not view the Reilly '859 patent, alone or in combination with U.S. Patent Nos. 3,803,570 to Barlow et al., Japan Patent 41121271A to Sagawa et al., U.S. Published Application No. 2004/0035602 to White, or 6,146,576 to Blackmore, as helpful in solving the problem addressed by the '740 application.

And furthermore, I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Jaime de la Rée

Dr. Jaime De La Rée

09/08/2008

Date

BIOGRAPHICAL SKETCH

Name: Jaime De La Ree
Date of Birth: December 17, 1957
Year Appointed: 1984

Degrees:

Instituto Tecnologico y de Estudios Superiores de Monterrey
Period: 1976 - 1980
Subjects: Electrical Engineering
Degree: Bachelor of Science in 1980
First Class. Top rank in graduating class of Electrical Engineering

University of Pittsburgh
Period: 1980 - 1981
Subject: Electrical Engineering
Degree: Master of Science

University of Pittsburgh
Period: 1982 - 1984
Subject: Electrical Engineering
Degree: Ph.D.

Field of Specialization:

Power Systems, Power System Protection, Electric Machinery

Academic Employment:

Virginia Polytechnic Institute and State University
Assistant Professor from 1984 - 1990
Associate Professor from 1990 - 2004
Assistant Department Head 2004 - Present

Professional Affiliations:

Institute of Electrical and Electronics Engineers (IEEE), N.Y.

(a) **Senior Member of IEEE (1993).**
(b) **Member:** Power System Relaying Committee of IEEE

Development of Research Laboratories:

(1) Power System Research Laboratory at Virginia Tech.
This laboratory includes innovations in real-time computer simulation of synchronous generators and their control, advanced-preceise synchronized phasor measurement systems and advanced protection schemes for power systems. The advanced equipment forms the basis of student theses at Virginia Tech.

(2) Power System Protection/Measurement Laboratory, Virginia Tech:
Laboratory developed for teaching and research, consisting of modern protection/measurement equipment donated by manufacturers of electric power equipment. The laboratory is used in a regularly scheduled course, and for research sponsored by industrial sponsors.

Invited Papers and Presentations:

1. Universidad Federal de Rio Grande do Sur, Porto Alegre, Brazil
Title: Computer Relaying for Power Systems
March 2003

(1) Invited "Engineering Education Lecture" at the International Conference on Education into the Year 2000, December 1998, Monterrey, Mexico.

(2) Invited "Fault Location in Power Systems" University of Bratislava, Bratislava, Slovakia, March 1997.

Journal Articles:

1. Torque Pulsations in Synchronous Motors Under Starting Conditions, J. De La Ree, H.B. Hamilton. IEEE Industry Applications Society, Vol. IA-23, No.3, pp 512-519, May/June 1987.
2. Torque Production in Permanent Magnet Motors, J. De La Ree, N. Boules. IEEE Industry Applications Society, Vol. 25, No.1, pp 107-112, Jan/Feb 1989.
3. PC Based Real-Time Simulation for Teaching Power Engineering Concepts,J. De La Ree, J. Latorre. IEEE-PES Transactions on Power Systems, Vol. 5, No.1, pp 326-330, February 1990.
4. Performance Evaluation of PM Machines with Quasi-Square Input Currents, J. De La Ree. Electric Machines and Power Systems, Vol. 18, No.3, pp 283-291, 1990.
5. Magnet Shaping to Reduce Induced Voltage Harmonics in PM Machines with Surface Mounted Magnets, J. De La Ree, N. Boules. IEEE-PES Transactions on Power Conversion, Vol. 6, No.1, pp 155-161, March 1991.
6. Electromechanical Forces and Torque in Brushless Permanent Magnet Machines, V. Gangla, J. De La Ree. IEEE-PES Transactions on Energy Conversion, Vol. 6, No.3, pp 546-552, September 1991.
7. Induced Voltage Harmonic Reduction of PM Cylindrical Machines, J. De La Ree, N. Boules. IEEE Transactions on Industry Applications, Vol. 28, No.3, pp 619-624, May/June 1992.
8. Stability and the Transient Energy Method for the Classroom, Dr. A. LLamas, Dr. J. De La Ree, IEEE, SSST 1993, March 09, 1993, Tuscaloosa, AL.
9. Adaptive Out-of-Step Relaying Using Phasor Measurement Techniques, V. Centeno, J. De La Ree, A.G. Phadke, G. Michel, J. Murphy, R. Burnett, IEEE Computer Applications in Power, Feature Paper, Vol. 6, No. 4, pp 12-17, October 1993.
10. Implementation of Adaptive Out-of-Step Relaying with Phasor Measurement, V. Centeno, J. De La Ree, J. Benton, M. Wilhem, G. Michel, Precise Measurement in Power Systems, Arlington, VA, October 27-29, 1993.
11. Flaws In Energy Function Methods For Transient Stability Analysis Of Power Systems, A. LLamas, J. De La Ree, L. Mili, A.G. Phadke, J.S. Thorp, Precise Measurement in Power Systems, Arlington, VA, October 27-29, 1993.
12. Testing an Adaptive Out-of-Step Relay Using Real-Time EMTP Playback Techniques, S. Anderson, K.C. Kong, J. De La Ree, A.G. Phadke, Y. Liu, II Simposio Iberoamericano de Proteccion de Sistemas Electricos de Potencia, Monterrey, NL, Mexico, November 16, 1993.
13. Clarifications of the BCU Method For Transient Stability Analysis, A. LLamas, J. De La Ree, L. Mili, A.G. Phadke, J.S. Thorp, IEEE, PES, WPM-94, New York, NY, February 01, 1994.
14. V. Centeno, J. De La Ree, A. G. Phadke, G. Michel, J. Murphy, R. Burnett, "Adaptive Out-of-Step Relaying Using Phasor Measurement Techniques", IEEE Computer Applications in Power, Vol. 6, No. 4, October 1993.
15. A. Llamas, J. De La Ree Lopez, L. Mili, A. G. Phadke, J. S. Thorp, "Clarifications of the BCU Method for Transient Stability Analysis" submitted for presentation at the IEEE Winter PES Meeting, 1994.
16. J.D. McCalley, V. Ajjarapu, J. De La Ree, et. al., "PowerLearn: Module Based Multimedia Courseware Development for Power System Engineering Education," to be published in Computer Applications in Power (CAP), 1998.
17. David C. Elizondo, J. De La Ree, Arun G. Phadke, Stan Horowitz, "Hidden Failures in Protection Systems and their impact on wide-area disturbances" IEEE PES Winter Meeting Proceedings, Columbus, OH, Feb. 2001.
18. David C. Elizondo, J. De La Ree, Arun G. Phadke, Stan Horowitz, "A Methodology to Evaluate Hidden Failure Effects Based on Regions of Vulnerability in Protection Schemes of Electric Power Systems" NAPS Conference, College Station Texas, Texas A & M University, October 15-16, 2001.
19. David C. Elizondo, J. De La Ree, "Protection System Failures – Wide Area Disturbances – The Hidden Failure Analysis" Proceedings of the 12th International Conference on Power System Protection, Bled, Slovenia, September 2000
20. Jaime De La Ree, David Elizondo, Juancarlo Depablos from VT, James Stoupis from ABB An Adaptive Protection Scheme for Power Distribution Systems, Beiging, China September 2002, CRIS Conference 2002.
21. Jaime De La Ree, David Elizondo, Analysis of Hidden Failures of Protection Schemes in Large Interconnected Power Systems, Beiging, China, September 2002, CRIS Conference2002.

22. J. De La Ree, Prof. Y. Liu, Prof. L. Mili, Prof. A.G. Phadke, Prof. L. Da Silva, Virginia Tech, Catastrophic Failures in Power Sytems - Causes, Analyses, and Countermeasures - , Proceedings of the IEEE, Special Issue on the subject of "Energy Infrastructure Defense Systems", 2004.
23. Wide Area Protection and Emergency Control, Working Group Report C-6, Power Systems Relaying Committee, IEEE-2004.
24. F.M. Uriarte, V.Centeno, J.De La Ree, J. DePablos, "Continuous vs Piecewise Hysterisis Model of a Current Transformer", IEEE PRIME 2006, 11-16 June, Otrnato (Lecce), Italy.
25. State Estimation (SE) using Wide Area Information Sharing (WAIS) and Phasor Measurement Units (PMUs), Robert F. Jeffers, Jaime De La Ree, James, S. Thorp, CRIS 2006.

Indusrtial Experience

Summer 1986 – General Motors Research Labs – Development of Computer-Based Models of PM Machines

Summer 2001 – ABB – ETI Raleigh, NC. Advanced Protection for Distribution Systems.

Summer 2002 – ABB –Meter Group, Raleigh, NC. Advanced

Summer 2004 – NASA – Wallops Flight Faility – Efficient Use of Energy.